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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/752,276	12/29/2000	John Belcea	GEH-01-064	9138
7590	03/09/2005			EXAMINER
John S. Beulick Armstrong Teasdale LLP Suite 2600 One Metropolitan Sq. St. Louis, MO 63102				SHARON, AYAL I
			ART UNIT	PAPER NUMBER
			2123	
			DATE MAILED: 03/09/2005	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/752,276	BELCEA, JOHN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Ayal I Sharon	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 16 November 2004.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-5,14-18,23-27,36-40 and 45 is/are rejected.
- 7) Claim(s) 6-13,19-22,28-35 and 41-44 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 29 December 2000 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                     | Paper No(s)/Mail Date. _____ .  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____ .                                  |

## **DETAILED ACTION**

### ***Introduction***

1. Claims 1-45 of U.S. Application 09/752,276, originally filed on 12/29/2000, are presented for examination. This application claims the priority filing date of Provisional Application 60/173,602, filed on 12/29/1999. In the amendment filed 11/16/2004, Applicant has amended claims 4-14, 26-36, and 45.

### ***Objection to Drawings***

2. This application has been filed with informal drawings which are acceptable for examination purposes only. Formal drawings will be required when the application is allowed.

### ***Objections to Specification***

3. The amendment filed 11/16/2004 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the changes to the units for parameters  $C_l(t)$ ,  $C_p(t)$ ,  $D(t)$ ,  $E_i(t)$ ,  $K_a$ ,  $K_{ei}$ ,  $K_l$ ,  $K_p$ ,  $K_r$ , and  $K_{rv}$  in Table 1 is not supported elsewhere in the specification.

Applicant is required to cancel the new matter in the reply to this Office Action, or indicate support for the amendment from elsewhere in the specification, or file a Continuation-In-Part for the new matter.

***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 4-5, 14, 26-27, 36, and 45 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility.**

6. Newton's Second Law is  $F = ma$ , where 'F' is Force, 'm' is mass, and 'a' is acceleration. However, the formulas in Applicant's claims violate this cardinal law of physics. Moreover, the formulas do not produce the correct resultant units. Therefore, these equations would produce incorrect ("inoperative") results.

- a. Claims 4, 26, and 45 use velocity instead of acceleration in calculating  $F_{(rf)}$ . The resultant unit from the formula, according to the units listed in Table 1 in the specification, is (lbs \*ft) / sec, which is not the correct unit for force.
  - b. Claims 5, 27, and 45 use velocity squared instead of acceleration in calculating  $F_{(af)}$ . The resultant unit from the formula, according to the units listed in Table 1 in the specification, is (lbs \*ft) / sec, which is not the correct unit for force.

c. Claims 14, 36, and 45 use a “brake force”  $D_t$  which has, according to Table 1 (Specification, p.5), has units of feet. The resultant unit from the formula, according to the units listed in Table 1 in the specification, is (lbs \*ft) / sec, which is not the correct unit for force.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. The prior art used for these rejections is as follows:

9. Gruber, P. et al., “Suboptimal Control Strategies for Multilocomotive Powered Trains”. IEEE Transactions on Automatic Control. June 1982. Vol.27, Issue 3, pp.536-546. (Henceforth referred to as “**Gruber**”).

10. The claim rejections are hereby summarized for Applicant’s convenience. The detailed rejections follow.

- 11. Claims 1-3, 15-16, 23-25, and 37-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Gruber.**

12. In regards to claim 1, Gruber teaches the following limitations:

1. A method for predicting train consist reactions to specific stimuli using a system including at least one measurement sensor located on a train consist, a data base, and a computer, the train consist including at least one locomotive and at least one railcar, said method comprising the steps of:  
collecting sensor data as the consist is moving;

**(Gruber, especially: Section I, “Introduction”, col.1 last paragraph – col.2, first paragraph)**

**Gruber teaches in the cited paragraph that:**

**“The control strategies developed in this paper are based on the assumptions that electro-pneumatic brakes are available and that there exists an exchange of information along the train [2]. The objective of the control is to minimize the coupler forces which results in safer operation or in increased traveling speeds.”**

determining a consist force balance utilizing the sensor data and the computer;  
**(Gruber, especially: Abstract, and Section II “Model”)**

**Gruber teaches the following in the abstract:**

**“This paper introduces two different controllers for the handling of very long multi-powered trains, including braking operations. The purpose of the controller is to minimize coupler forces and velocity deviations from reference values due to grade changes and other disturbances.”**

**Gruber teaches the following in Section II:**

**“If  $v$  represents the actual velocity vector and  $u$  the actual input vector consisting of throttling and braking forces, then the deviations from nominal values are defined by**

$$\delta v = v - {}^0v \text{ and } \delta u = u - {}^0u$$

**The nominal velocity  ${}^0v$  is maintained by  ${}^0u$ , which is equal to the resistance and gravity forces”**

determining a set of consist coefficients using the computer; and  
**(Gruber, especially: Abstract, and Section II “Model”)**

**Examiner finds that the “actual velocity vector” and “actual input vector ... of throttling and braking forces” corresponds to the claimed “coefficients”.**

predicting train consist kinetic characteristic values using the consist force balance and the set of consist coefficients.

**(Gruber, especially: Abstract, and Section II “Model”)**

**Examiner finds that the model described in detail in Section II predicts train consist kinetic characteristics.**

13. In regards to claim 2, Gruber teaches the following limitations:

2. A method in accordance with Claim 1 wherein said step of collecting sensor data comprises the steps of:

monitoring a force applied to the consist utilizing the at least one measurement sensor;  
**(Gruber, especially: Abstract")**

**Gruber teaches the following in the abstract:**

**"This paper introduces two different controllers for the handling of very long multi-powered trains, including braking operations. The purpose of the controller is to minimize coupler forces and velocity deviations from reference values due to grade changes and other disturbances."**

generating force data with respect to the force applied; and  
**(Gruber, especially: Abstract, and Section II "Model")**

**Gruber teaches the following in Section II:**

**"If  $v$  represents the actual velocity vector and  $u$  the actual input vector consisting of throttling and braking forces, then the deviations from nominal values are defined by**

$$\delta v = v - {}^0v \text{ and } \delta u = u - {}^0u$$

**The nominal velocity  ${}^0v$  is maintained by  ${}^0u$ , which is equal to the resistance and gravity forces"**

communicating the force data to the computer.  
**(Gruber, especially: Abstract, and Section II "Model")**

**Examiner finds the communication of the sensor data to the controller to be inherent in a control system, otherwise the control system will not be able to function.**

14. In regards to claim 3, Gruber teaches the following limitations:

3. A method in accordance with Claim 1 wherein said step of determining a consist force balance comprises the step of determining a set of consist kinetic elements.

**(Gruber, especially: Abstract, and Section II "Model")**

**Gruber teaches the following in the abstract:**

**"This paper introduces two different controllers for the handling of very long multi-powered trains, including braking operations. The purpose of the controller is to minimize coupler forces and velocity deviations from reference values due to grade changes and other disturbances."**

**Gruber teaches the following in Section II:**

**"If  $v$  represents the actual velocity vector and  $u$  the actual input vector consisting of throttling and braking forces, then the deviations from nominal values are defined by**

$$\delta v = v - {}^0v \text{ and } \delta u = u - {}^0u$$

**The nominal velocity  ${}^0v$  is maintained by  ${}^0u$ , which is equal to the resistance and gravity forces"**

**Examiner finds that the velocity and force vectors correspond to the claimed "set of kinetic elements".**

15. In regards to claim 15, Gruber teaches the following limitations:

**15. A method in accordance with Claim 3 wherein said step of determining a set of kinetic elements further comprises the step of determining traction force.  
(Gruber, especially: Section II "Model")**

**Gruber teaches the following in Section II:**

**"If  $v$  represents the actual velocity vector and  $u$  the actual input vector consisting of throttling and braking forces, then the deviations from nominal values are defined by**

$$\delta v = v - {}^0v \text{ and } \delta u = u - {}^0u$$

**The nominal velocity  ${}^0v$  is maintained by  ${}^0u$ , which is equal to the resistance and gravity forces"**

**Examiner finds that the velocity and force vectors correspond to the claimed "set of kinetic elements".**

16. In regards to claim 16, Gruber teaches the following limitations:

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16. A method in accordance with Claim 3 wherein said step of determining a force balance further comprises the step of summing the set of consist kinetic elements.

(Gruber, especially: Section II “Model”)

Gruber teaches the following in Section II (col.1, p.538):

**“The linearized drag terms can be neglected compared with the damping forces associated with  $c_c$  and  $c_L$ , respectively. For the input u, the constraints are given by**

$$u_i = {}^0u_i + \delta u_i \leq 0 \quad i = 2, \dots, m-1, m+1, \dots, n-1$$

Examiner finds that this equation corresponds to the claimed “step of summing the set of kinetic elements”.

17. Claims 23-25 and 37-38 are rejected based on the same reasoning as

claims 1-3 and 15-16, supra. Claims 23-25 and 37-38 are system claims reciting the equivalent limitations as are recited in method claims 1-3 and 15-16 and taught throughout Gruber.

#### ***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. The prior art used for these rejections is as follows:

20. Gruber, P. et al., "Suboptimal Control Strategies for Multilocomotive Powered Trains". IEEE Transactions on Automatic Control. June 1982. Vol.27, Issue 3, pp.536-546. (Henceforth referred to as "**Gruber**").
21. Claerbout. "Spectral Factorization". Earth Soundings Analysis: Processing versus Inversion (PVI). © 1992. Posted on Internet 10/21/1998. (Henceforth referred to as "**Claerbout PVI**").
22. Claerbout. "Confidence Intervals" and "Data Modeling by Least Squares". Fundamentals of Geophysical Data Processing (FGDP). © 1976. Posted on Internet 10/21/1998. (Henceforth referred to as "**Claerbout FGDP**").
23. The claim rejections are hereby summarized for Applicant's convenience. The detailed rejections follow.
- 24. Claims 17-18 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gruber in view of Claerbout FGDP and further in view of Claerbout PVI.**
25. In regards to claim 17:
  17. A method in accordance with Claim 1 wherein said step of determining a set of consist coefficients comprises the step of using a least squares method to determine consist coefficients.

Gruber teaches that "Previous analytical studies have been concentrated either on the control of the brakeless operation or on nominal trajectory or schedule calculations. The solution paths for these designs are summarized in Fig.1" (See Section I "Introduction", p.536, col.2).

Moreover, among the paths shown in Fig.1, "Path 2 was taken by Barry and Davis [5], [6]. They used a distributed parameter model of the train and designed an optimal controller by spectral factorization."

Gruber does not expressly teach the use of a "least squares method to determine consist coefficients."

The Claerbout PVI reference, in its "Spectral Factorization" article, on the other hand, teaches that "The **Kolmogoroff** method of spectral factorization, which we will be looking at here, is much faster than the time-domain, least-squares methods considered in chapter (-) and the least squares method given in FGDP. Its speed motivates its widespread practical use."

The cited Claerbout FGDP reference teaches the use of the least squares method to determine coefficients in the section titled "Data Modeling by Least Squares."

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gruber with those of the Claerbout FGDP, because Claerbout PVI teaches that the use of the least-squares method was a well-known step backwards in the art.

26. In regards to claim 18,

18. A method in accordance with Claim 17 wherein said step of using the least squares method comprises the steps of:  
weighting data;  
solving the system;  
and determining a confidence measure.

Gruber teaches that "Previous analytical studies have been concentrated either on the control of the brakeless operation or on nominal trajectory or schedule calculations. The solution paths for these designs are summarized in Fig.1" (See Section I "Introduction", p.536, col.2).

Moreover, among the paths shown in Fig.1, "Path 2 was taken by Barry and Davis [5], [6]. They used a distributed parameter model of the train and designed an optimal controller by spectral factorization."

Gruber does not expressly teach the use of a "least squares method to determine consist coefficients."

The Claerbout PVI reference, in its "Spectral Factorization" article, on the other hand, teaches that "The **Kolmogoroff** method of spectral factorization, which we will be looking at here, is much faster than the time-domain, least-squares methods considered in chapter (-) and the least squares method given in FGDP. Its speed motivates its widespread practical use."

The cited Claerbout FGDP reference teaches the use of the least squares method to determine coefficients in the section titled "Data Modeling by Least Squares." This includes weighing data (see the section titled "Weights and Coefficients") and solving the system (see the section titled "Fewer Equations than Unknowns"). In addition, Claerbout FGDP also teaches the use of Confidence Intervals in an article titled "Confidence Intervals" in the section "Resolution".

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gruber with those of the Claerbout FGDP, because Claerbout PVI teaches that the use of the least-squares method was a well-known step backwards in the art.

**27. Claims 39-40 are rejected based on the same reasoning as claims 17-18, *supra*. Claims 39-40 are system claims reciting the equivalent limitations as are recited in method claims 17-18 and taught throughout Gruber.**

***Response to Amendment***

**Re: Claim Rejections - 35 USC § 101**

28. Applicant has amended Table 1 of the specification in order to change the units of the variables that prompted the 35 USC § 101 rejections. Examiner has objected to these amendments on the grounds that they constitute new matter. Therefore, the 35 USC § 101 rejections are maintained.

**Re: Claim Rejections - 35 USC § 112**

29. Applicant persuasively argues (amendment filed 11/16/2004, p.24) that the equation for "The 'elevation functions' used to calculate  $F_{(ef)}$ " is enabled in pages 7-8 of the specification. Examiner has therefore withdrawn the 35 USC § 112, first paragraph rejections of claims 6, 28, and 45.

30. Applicants have amended claims 4-14, 26-36, and 45 so as to include the definitions of the parameters in the claimed equations in the claims. Examiner

has therefore withdrawn the 35 USC § 112, second paragraph rejections of these claims.

Re: Claim Rejections - 35 USC § 102

31. Applicants unpersuasively argue (amendment filed 11/16/2004, pp.25-27) that in regards to independent claims 1 and 23, and their dependent claims 2-3, 15-16, 24-25 and 37-38, that the Gruber reference:

Notably, Gruber does not describe collecting sensor data and determining a train force balance using sensor data. (Amendment, p.26, para.1)

In fact, Applicant submits that Gruber does not describe or suggest collecting sensor data. (Amendment, p.26, para.2)

Additionally, Applicant respectfully submits that “an exchange of information along a train” does not describe collecting sensor data. (Amendment, p.26, para.2)

In fact, Applicant submits that Gruber does not describe or suggest determining a consist force balance. (Amendment, p.26, para.3)

32. Examiner reminds the Applicant that Gruber teaches control strategies and control systems for multi-locomotive powered trains (See Gruber: Abstract and Introduction). Examiner respectfully submits that it is inherent that a control system collects sensor data, otherwise the control system cannot perform its intended function of controlling.

33. Examiner also reminds the Applicant that, as stated in the original rejection, Gruber expressly teaches (see p.1, Introduction):

The control strategies developed in this paper are based on the assumptions that electro-pneumatic brakes are available and that there exists an exchange of information along the train [2]. The objective of the

control is to minimize the coupler forces which results in safer operation or in increased traveling speeds.

As stated in the original rejection, Examiner finds that Gruber's "coupler forces" in the multi-locomotive "... Long freight trains consisting of 100-150 identical large capacity cars ..." (See Gruber: Introduction) reads on the Applicant's claimed "consist force balance." While Gruber does not expressly use the term "balance", Gruber does teach that "The objective of the control is to minimize the coupler forces ...", corresponding to an equilibrium (or "balance") of zero coupler forces.

34. Examiner notes that MPEP §2131 states that "The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."
35. Applicants also unpersuasively argue (amendment filed 11/16/2004, pp.29-31) that in regards to independent claims 1 and 23, the Gruber reference does not "describe nor suggest a method for predicting train consist reactions to specific stimuli" as recited in Claims 1 and 23.
36. Examiner notes that "specific stimuli" is mentioned only in the preambles of Claims 1 and 23, but not in the bodies of these claims.
37. The preambles of Claims 1 and 23, as presented for examination, therefore have not been given patentable weight. Appropriate weight is given to limitations recited in the body of the claim that are needed for purpose of antecedence. "A mere statement of purpose or intended use in the preamble of a claim need not be considered in finding anticipation; however, it must be considered if the

language of a preamble is necessary to give meaning to the claim" *Diversitech Corp. v. Century Steps, Inc.*, 7 USPQ2d 1315 (Fed. Cir. 1988); *In re Stencel*, 4 USPQ2d 1071 (Fed. Cir. 1987)

38. In addition, Examiner notes that Gruber (see Fig.8) teaches the simulation results of a control system from two "specific stimuli": throttling and braking.
39. Examiner is therefore maintaining the 35 USC § 102 rejections of claims 1-3, 15-16, 23-25 and 37-38.

Re: Claim Rejections - 35 USC § 103

40. Applicant unpersuasively argues (Amendment, p.28) that the 35 USC § 103 rejections of claims 17-18 and 39-40 are improper because (emphasis added):

... Applicant respectfully submits that it would not be obvious to one of ordinary skill in the art to combine Gruber with any of Claerbout FGDP or Claerbout PVI, **because there is no motivation to combine the references suggested in the art.**

Examiner respectfully disagrees. As stated in the original rejection of Claim 17, (copied here in full):

Gruber teaches that "Previous analytical studies have been concentrated either on the control of the brakeless operation or on nominal trajectory or schedule calculations. The solution paths for these designs are summarized in Fig.1" (See Section I "Introduction", p.536, col.2).

Moreover, among the paths shown in Fig.1, "Path 2 was taken by Barry and Davis [5], [6]. They used a distributed parameter model of the train and designed an optimal controller by spectral factorization."

Gruber does not expressly teach the use of a "least squares method to determine consist coefficients."

The Claerbout PVI reference, in its "Spectral Factorization" article, on the other hand, teaches that "The Kolmogoroff method of spectral factorization, which we will be looking at here, is much faster than the

time-domain, least-squares methods considered in chapter (-) and the least squares method given in FGDP. Its speed motivates its widespread practical use."

The cited Claerbout FGDP reference teaches the use of the least squares method to determine coefficients in the section titled "Data Modeling by Least Squares."

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gruber with those of the Claerbout FGDP, because Claerbout PVI teaches that the use of the least-squares method was a well-known step backwards in the art.

Examiner finds that the Gruber reference teaches the use of Spectral Factorization, while the Claerbout FGDP reference teaches the use of "least squares". The Claerbout PVI reference, as presented in the original rejection, provides the motivation to combine the Claerbout FGDP reference with the Gruber reference (emphasis added):

**The Kolmogoroff method of spectral factorization, which we will be looking at here, is much faster than the time-domain, least-squares methods considered in chapter (-) and the least squares method given in FGDP. Its speed motivates its widespread practical use.**

Therefore it follows that (1) the use of "least squares" was well known in the art at the time the invention was made, and (2) the use of least squares was a step backwards in the art.

41. Applicant also unpersuasively argues (Amendment, p.28):

Additionally, the Examiner has not pointed to any prior art that teaches or suggests to combine the disclosures, other than Applicant's own teaching.

This is blatantly false. The Examiner (1) pointed to Claerbout PVI reference that provides a motivation to combine the Claerbout FGDP reference with the Gruber

reference (see the above paragraph), and (2) made no reference whatsoever to Applicant's own teaching.

42. Applicant also unpersuasively argues (Amendment, p.28):

Rather, only the conclusory statement that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Gruber with those of Claerbout FGDP, because Claerbout PVI teaches that the use of the least squares method was a well-known step backwards in the art" suggests combining the disclosures.

The Claerbout PVI reference, as presented in the original rejection, provides the motivation to combine the Claerbout FGDP reference with the Gruber reference (emphasis added):

**The Kolmogoroff method of spectral factorization, which we will be looking at here, is much faster than the time-domain, least-squares methods considered in chapter (-) and the least squares method given in FGDP. Its speed motivates its widespread practical use.**

Therefore it follows that (1) the use of "least squares" was well known in the art at the time the invention was made, and (2) the use of least squares was a stepbackwards in the art.

43. Applicant also unpersuasively argues (Amendment, p.28-29) that the Examiner used "hindsight reconstruction" in the 35 USC § 103 rejections. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a

reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

44. Examiner is therefore maintaining the 35 USC § 103 rejections of claims 17-18 and 39-40.

#### ***Allowable Subject Matter***

45. Claims 6-13, 19-22, 28-35, and 41-44 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and all intervening claims.

#### ***Conclusion***

46. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

47. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a biweek, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached at (571) 272-3716.

Any response to this office action should be faxed to (703) 872-9306, or mailed to:

USPTO  
P.O. Box 1450  
Alexandria, VA 22313-1450

or hand carried to:

USPTO  
Customer Service Window  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

Ayal I. Sharon

Art Unit 2123

March 3, 2005



KEVIN J. TROSKA  
SUPERVISORY  
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